Practical Work in Image Processing

1 Requirements

- *Task specification.* In this task, you should write and submit an object detection program based on the histogram of oriented gradients that reads object represented in $image_A$ and detects its occurrences in $image_B$. This program should meet **the following requirements**:

  1. It performs adaptive binarization and cropping of an input image.
  2. It computes a histogram of oriented gradients for a given image. The input parameters are: grayscale image, number of chaincode directions, and grid dimension. Then, it estimates the similarity between two input images by calculating the cosine similarity between their histograms of oriented gradients.
  3. It reads an object represented in $image_A$ and detects its occurrences in $image_B$, by applyling the sliding window technique. The input parameters are: two grayscale images, number of chaincode directions, grid dimension, sliding window dimension, sliding window steps along the x- and y-axis, etc.

- In addition, you should write and submit a report on your program. A report on a project task should be submitted as a single pdf-document. On the top of the first page include: you name and matriculation number, date of submission and task number. The report should clearly indicate your reasoning process and illustrate the functionality of your program (e.g., you may represent appropriate images). If appropriate, it should include details of the underlying model, information on the (pre-)processing the data, the training procedure, the testing procedure and the evaluation results. You may additionally include any other aspect of your work that you find relevant.

2 Avoiding Plagiarism

You must cite all the sources that you have used in your project (including text, source codes, images, figures, etc). If you have any questions regarding plagiarism or academic misconduct then please contact me (preferably before you turn in your report).

3 Submission

- For each project task you should submit your (i) source code and (ii) report.
- **Submissions should be sent to milangnjatovic@yahoo.com.**
- The submission deadlines will be announced in a timely manner in lectures and at `http://gnjatovic.info/imageprocessing/`. If you cannot submit your assignment in time please contact me as soon as possible.